

AMENDMENTS TO THE CLAIMS

1-4. (Canceled)

5. (Currently amended) A method for continuous anaerobic culture of lactic acid producing anaerobic microorganisms in a fermenter to produce lactic acid, wherein ~~the~~an active lactic acid producing cell population is maintained constant, when the fermentation is operated continuously, by feeding glucose substrate and alkaline solution alternately, and wherein the residual glucose concentration of culture liquid is controlled by:

<I> feeding the glucose substrate at a rate based on an alkaline consumption per unit time, wherein there is performed the following:

<I-a> calculating a glucose quantity (G_Q) to be supplied to the fermenter based on the following equation (3)

$$G_Q = \frac{fF_1 \times 90}{0.95} + C \quad (3) \text{ wherein:}$$

f = a coefficient of normality of IN-NaOH in the fermentation,

F_1 = the medium feed rate of glucose and

C = a term for adjustment of residual glucose in the fermentation and the following equation (4):

$$F_1 = \frac{G_Q}{S} \quad (4)$$

wherein S is the glucose concentration (g/l) of the feed solution.;

<I-b> calculating a rate of glucose substrate flow-in (F_2) based on the calculated G_Q ; and

<I-c> feeding the glucose substrate at the rate of calculated F_2 ; and essentially at the same time

<II> recycling glucose substrate back to the fermenter, wherein there is performed the following:

<II-a> bleeding out the culture liquid including the cells, removing the cells; ~~and~~

<II-b> returning to the fermenter the culture liquids~~substrate~~ that the cells have been removed from ~~in the culture liquid~~ and wherein the residual glucose concentration is maintained constant

by feeding glucose substrate of molarity that is equal to cumulative consumption molarity of alkaline solution added in order to control pH of the culture liquid; and-
<III> harvesting lactic acid from the culture liquid.

6. (Canceled)

7. (Previously presented) The method for continuous culture of the anaerobic microorganisms according to Claim 5, wherein a diluted alkaline solution is used forming a large dilution effect of culture liquid whereby high specific activity of the microorganisms and high volumetric productivity are maintained.

8-14. (Canceled)

15. (New) A method for continuous anaerobic culture of ethanol producing anaerobic microorganisms in a fermenter to produce ethanol, wherein an active ethanol producing cell population is maintained constant, when the fermentation is operated continuously, by feeding glucose substrate and alkaline solution alternately, and wherein the residual glucose concentration of culture liquid is controlled by:

<I> feeding the glucose substrate at a rate based on an alkaline consumption per unit time, wherein there is performed the following:

<I-a> calculating a glucose quantity (G_Q) to be supplied is calculated from the alkaline consumption for glucose intake by the following equation where:

$$G_Q = \frac{fF_1f_H \times 180}{0.95} + C$$

where

f = a coefficient of normality of 1N-NaOH in the fermentation

F₁ = the medium feed rate of glucose

f_H = the reciprocal number of ml of 1N-NaOH required for 1 mole (180g) of glucose intake and

C = a term for adjustment of the residual glucose concentration in the fermentation and the following equation:

$$F_1 = \frac{G_Q}{S}$$

wherein S is the glucose concentration (g/l) of the feed solution;

<I-b> calculating a rate of glucose substrate flow-in (F₂) based on the calculated G_Q; and

<I-c> feeding the glucose substrate at the rate of calculated F₂; and essentially at the same time

<II> recycling glucose substrate back to the fermenter, wherein there is performed the following:

<II-a> bleeding out the culture liquid including the cells, removing the cells; and

<II-b> returning to the fermenter the culture liquid that the cells have been removed from and

wherein the residual glucose concentration is maintained constant by feeding glucose substrate of molarity that is equal to cumulative consumption molarity of alkaline solution added in order to control pH of the culture liquid;

<III> harvesting ethanol from the culture liquid

wherein <I-a> the glucose quantity (G_Q) to be supplied to the fermenter is based on a predetermined upper and lower limit of pH, wherein at the upper limit, substrate is fed and at the lower limit, alkaline solution is fed.

16. (New) The method for continuous culture of the anaerobic microorganisms according to Claim 15, wherein a diluted alkaline solution is used forming a large dilution effect of culture liquid whereby high specific activity of the microorganisms and high volumetric productivity are maintained.

17. (New) The method of claim 5, wherein the active lactic acid producing cell population is *Lactococcus lactis* IO-1(JCM7630).

18. (New) The method of claim 15, wherein the active ethanol producing cell population is *Zymomonas mobilis* NRRLB-14023.